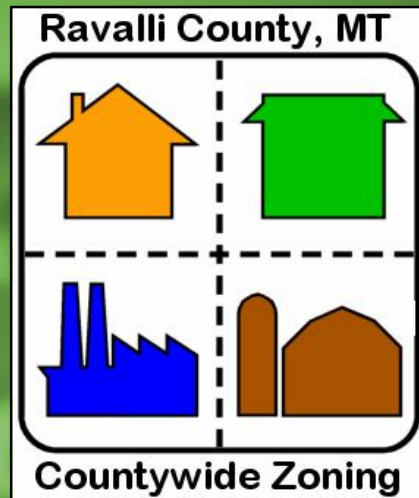


# **Countywide Zoning Project**

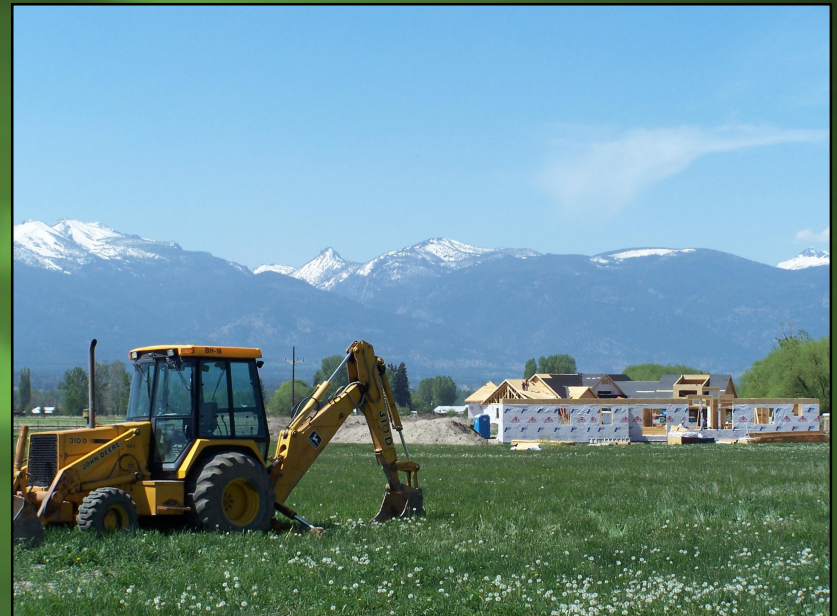
## **Introduction to the Land Suitability Analysis**



**Ravalli County Planning Department**  
**January 2008**

# **Land Suitability Analysis**

**GIS (Geographic Information Systems)-based Tool for  
Evaluating the Suitability of  
Land for Development**



# **Goals**

- 1) Identify areas suitable for development**
- 2) Identify areas unsuitable for development**
- 3) Compile existing data**
- 4) Gather local knowledge**
- 5) Identify data gaps**
- 6) Develop tool for zoning**

# **Limitations**

- 1) Not a zoning map**
- 2) No new data**
- 3) Not site specific**





# **Introduction to the Land Suitability Analysis**

**□ What is GIS?**

**□ Why use GIS?**

**□ The Land Suitability  
Analysis**

# **What is GIS?**

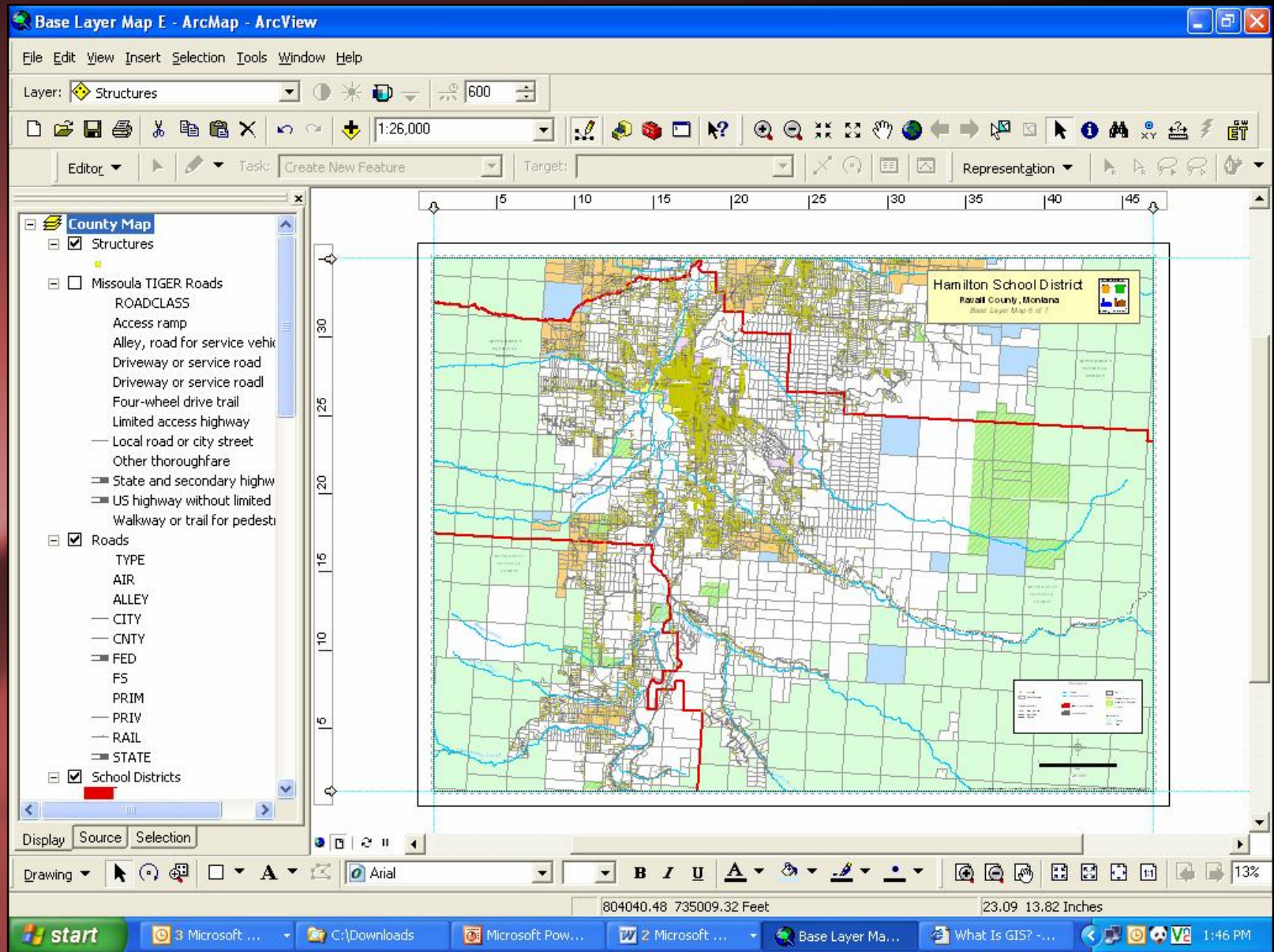
- ☐ **Hardware**
- ☐ **Software**
- ☐ **Geographic Data**
- ☐ **Personnel**

# Hardware





# Software – ArcGIS

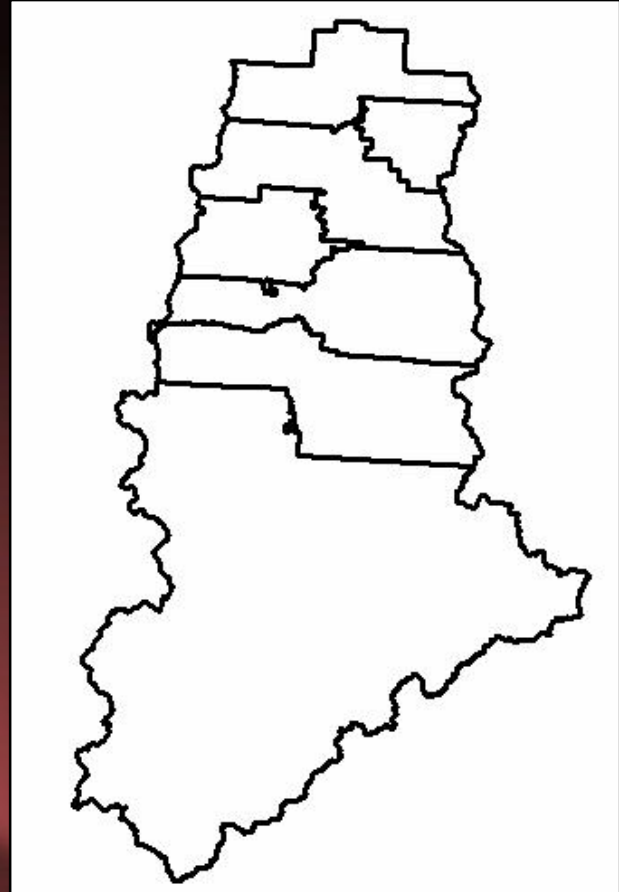




# Geographic Data

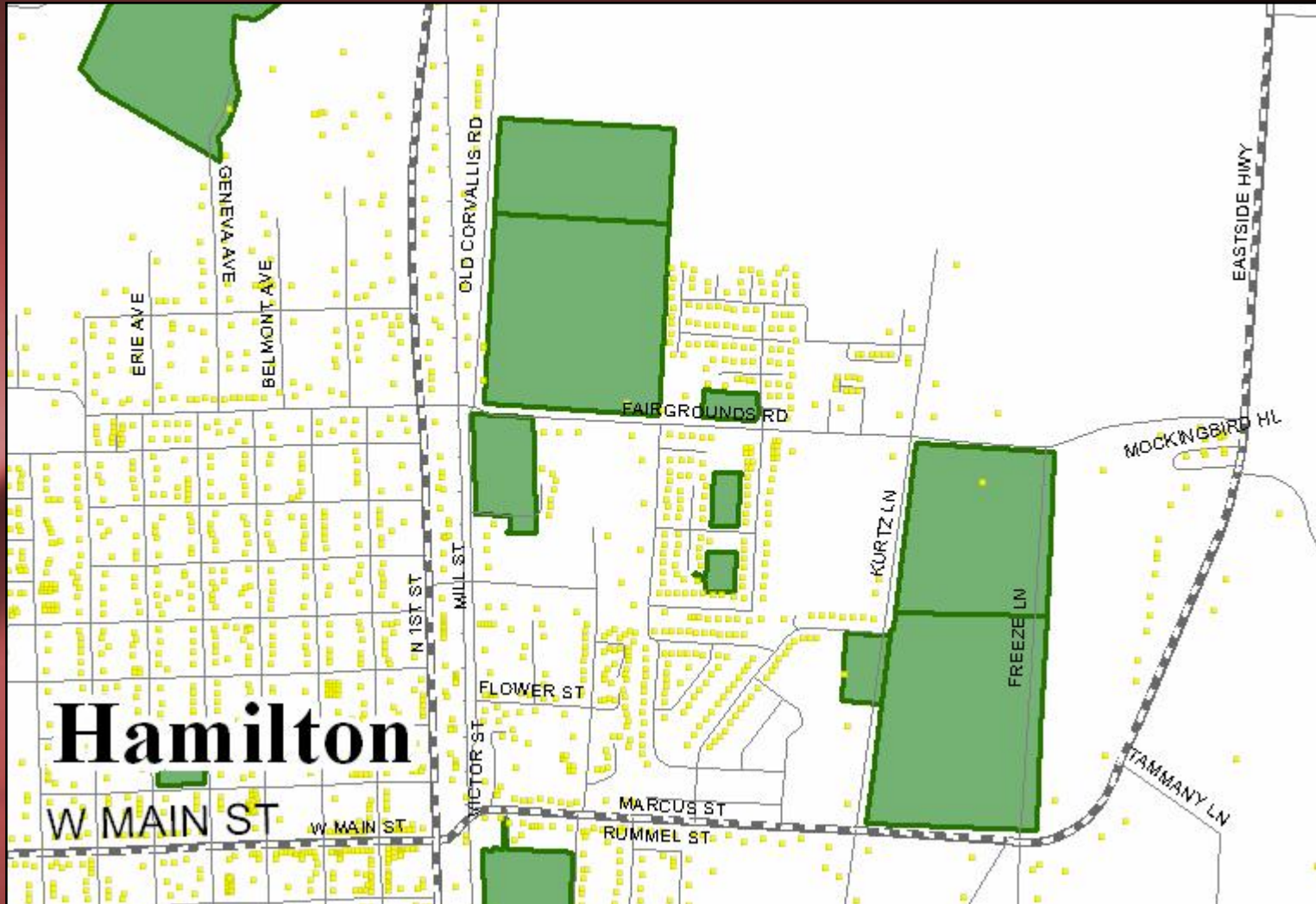
□ Map Layer

□ Attribute Table

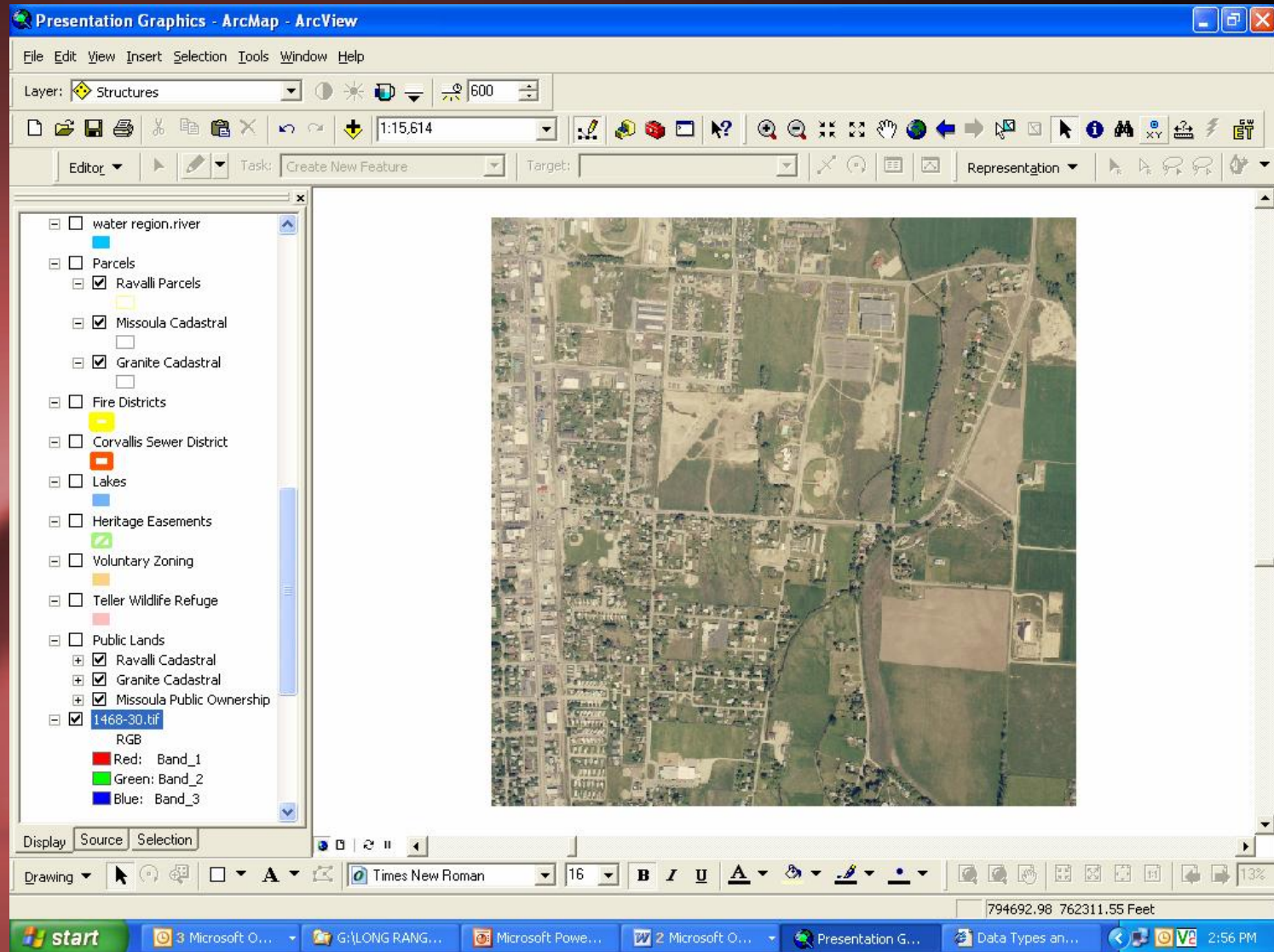


	FID	Shape	AREA	PERIMETER	SCHOOL#	SCHOOL-ID	NAME
▶	1	Polygon	3564279515.65374	379120.921096	1	1	DARBY
	2	Polygon	389306584.422405	117757.373495	2	7	FLORENCE CARLTON
	3	Polygon	309985933.712254	101413.053065	3	4	VICTOR
	4	Polygon	195205026.087814	72057.07476	4	6	LONE ROCK ELEMENTARY
	5	Polygon	629816291.847842	165908.633611	5	3	CORVALLIS ELEMENTARY
	6	Polygon	714586257.24476	165851.607124	6	2	HAMILTON
	7	Polygon	504192898.712336	150899.367623	7	5	STEVENSVILLE ELEMENTARY
	8	Polygon	3341533.693257	10164.112104	8	8	PINESDALE ELEMENTARY
	9	Polygon	633157825.541103	160932.279989	9	9	CORVALLIS HIGH
	10	Polygon	699397924.800152	159048.905326	10	10	STEVENSVILLE HIGH

# Map Layer



# Map Layer





# How are map layers created?





# Attribute Table

Base Layer Map E - ArcMap - ArcView

File Edit View Insert Selection Tools Window Help

Attributes of Roads

ROADS#	ROADS-ID	NAME	NAME2	NAME3	TYPE	CLASS	SURFACE	SOURCE
3554	3683	W MAIN ST			STATE	MI	P2D	1995
3559	3688	W MAIN ST			STATE	NONE	G2M	1995
3565	3694	W MAIN ST			STATE	NONE	G2M	1995
3568	3697	W MAIN ST			STATE	NONE	G2M	1995
3571	3700	W MAIN ST			STATE	NONE	G2M	1995
3573	3702	W MAIN ST			STATE	NONE	G2M	1995
3576	3706	W MAIN ST			STATE	NONE	G2M	1995
3578	3708	W MAIN ST			STATE	MI	P2D	1995
3580	3710	W MAIN ST			STATE	NONE	G2M	1995
3582	3712	W MAIN ST			STATE	MI	G2M	1995
3584	3714	W MAIN ST			STATE	MI	P2D	1995
3585	3716	W MAIN ST			STATE	MI	P2D	1995
3588	3719	W MAIN ST			STATE	MI	P2D	1995
4705	4871	W MILES AV			CITY	NONE	P2D	1995
4707	4873	W MILES AV			CITY	NONE	P2D	1995
4709	4875	W MILES AV			CITY	NONE	P2D	1995

Record: 1 Show: All Selected Records (0 out of 6082 Selected)

Legend:

- US highway without limited Walkway or trail for pedest
- ☒ Roads
  - TYPE
  - AIR
  - ALLEY
  - CITY
  - CNTY
  - FED
  - FS
  - PRIM
  - PRIV
  - RAIL
  - STATE
- ☐ School Districts

Map View:

Hamilton

Streets shown: WEST BRIDGE RD, W MAIN ST, S 1ST ST, BIRCH ST, FAIRGROUNDS RD, FREEZE LN, HATTIE LN, KURTZ LN, COOPER LN, WERTH LN, BIG CORRAL RD, GOLF COURSE RD, TAMMANY LN, AIRPORT RD, DALY MANSION RD, EASTSIDE HWY, STOCK FARM RD.

Display Source Selection

Drawing Times New Roman 16 B I U A

793778.28 763923.21 Feet

start 3 Microsoft ... G:\LONG RAN... Microsoft Pow... 2 Microsoft ... Base Layer Ma... What Is GIS? ... 1:56 PM

# Personnel

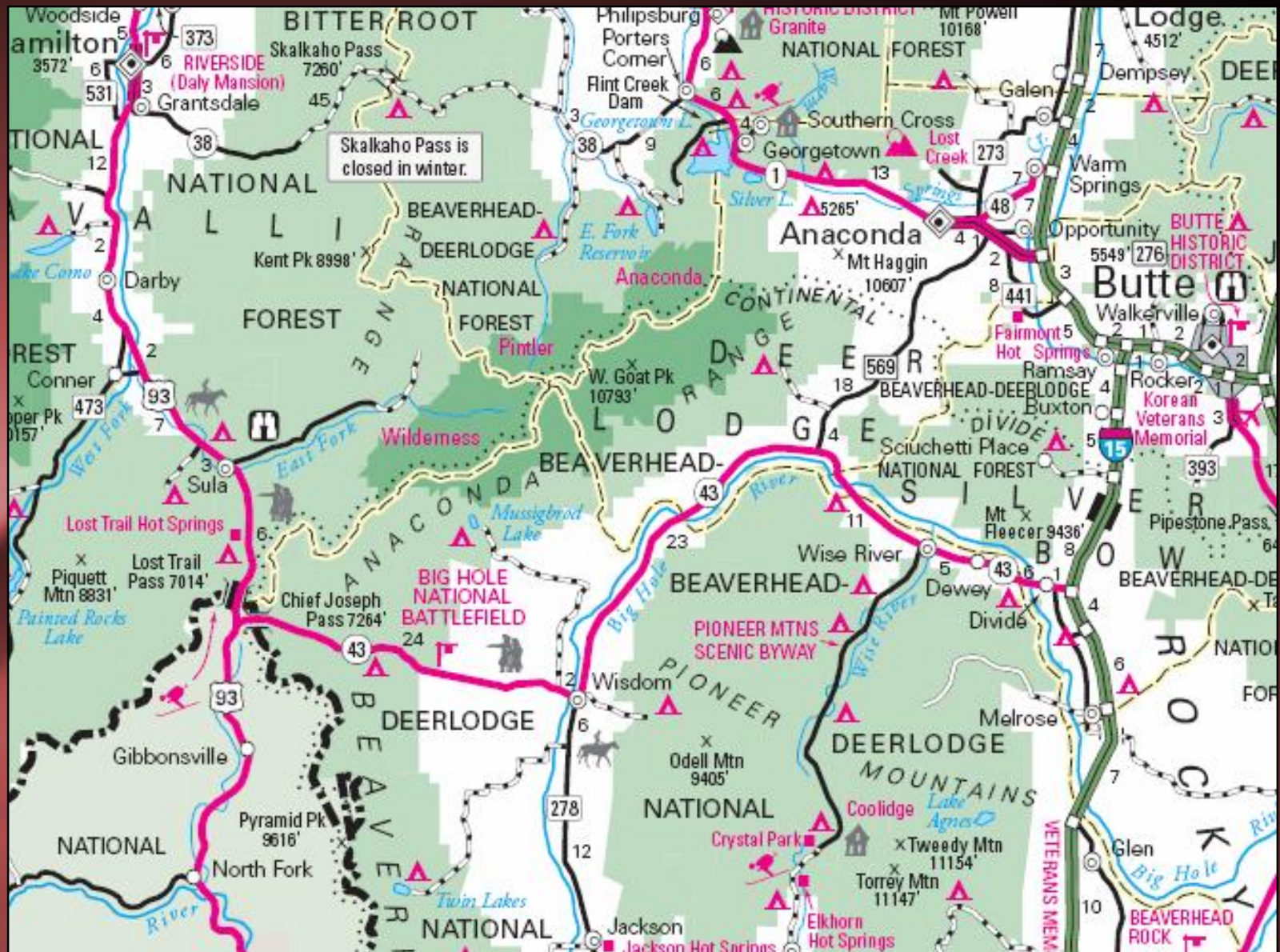




# **Why Use GIS?**

- ❑ Data Organization**
- ❑ Ability to see many layers at once**
- ❑ To answer questions**

# Data Organization



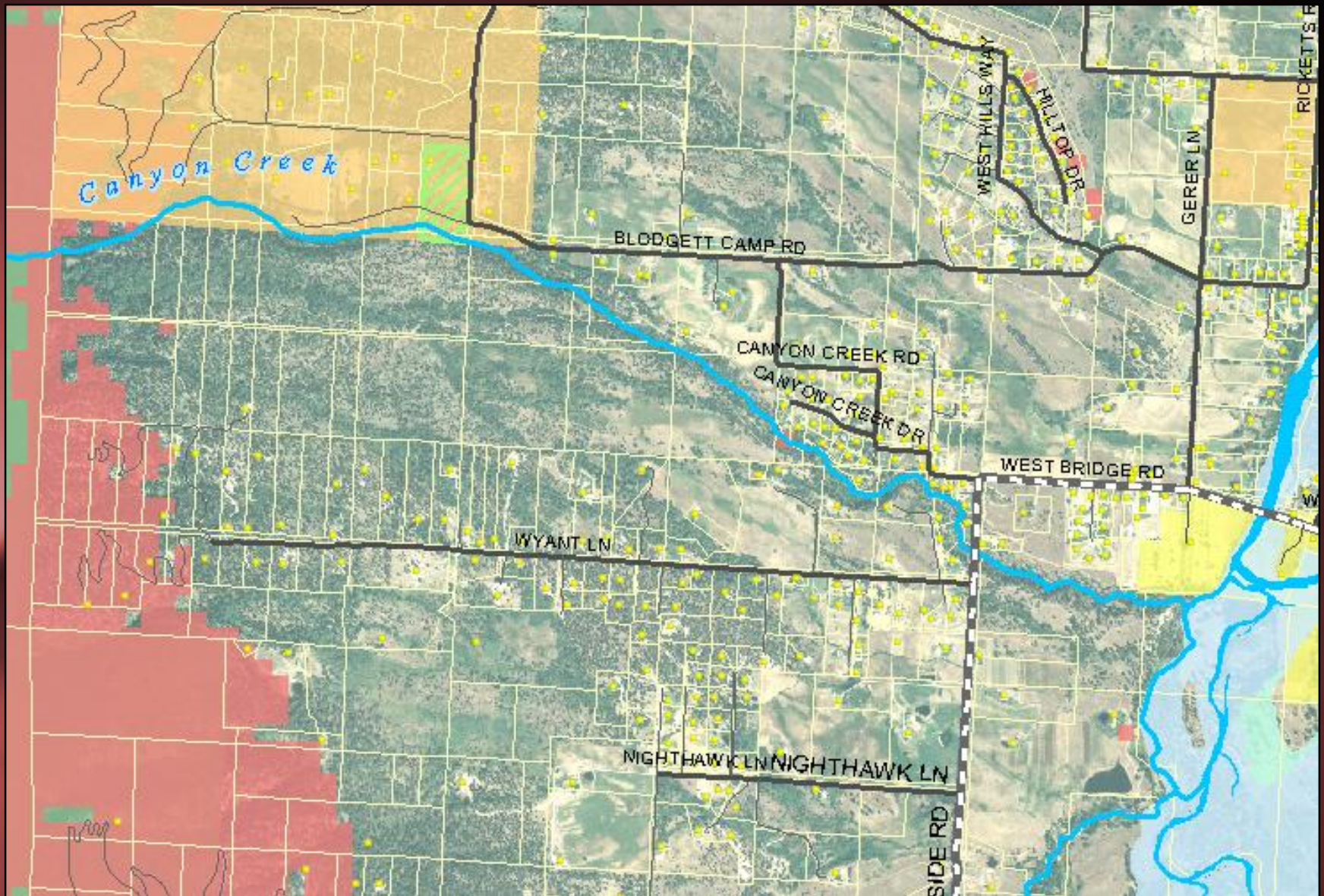


# Many Layers At Once





# Many Layers At Once



# **Step 1: Identify Question**

**□ Where is the best location for a hockey arena in Ravalli County?**





# **Step 2: Define Characteristics**

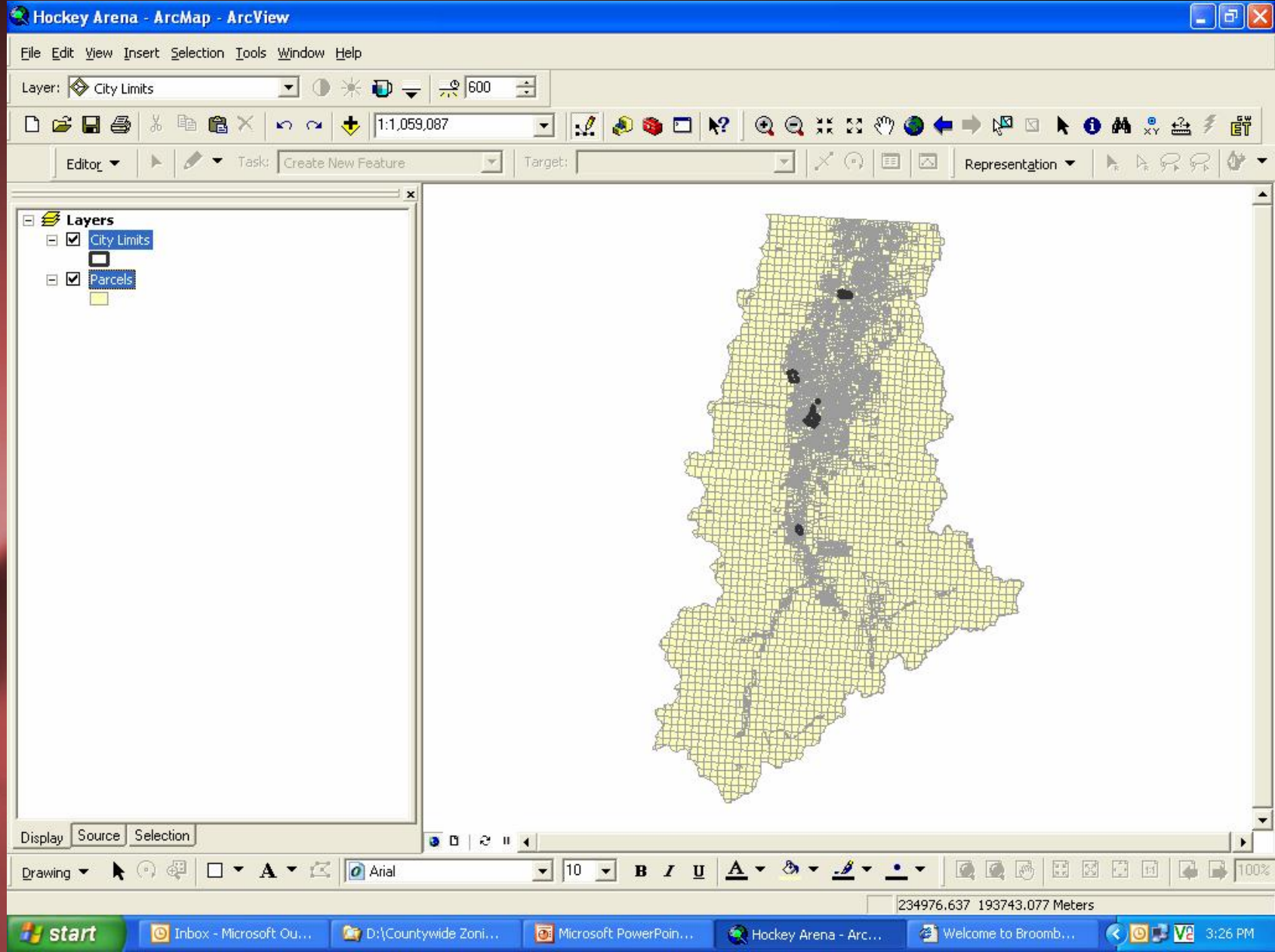
**☐ Parcel size greater than 40 Acres**

**☐ Private ownership (not public lands)**

**☐ Within one mile of an incorporated city**



# Step 3: Compile Geographic Data



# Step 4: GIS Queries

Hockey Arena - ArcMap - ArcView

File Edit View Insert Selection Tools Window Help

Layer: City Limits

1:1,059,087

Task: Create New Feature Target:

Representation

**Layers**

- ☒ City Limits
- ☒ Parcels

**Attributes of Parcels**

FID	Shape	OWNCODE
0	Polygon	22100
1	Polygon	22100
2	Polygon	22100
3	Polygon	22100
4	Polygon	22100
5	Polygon	22100
6	Polygon	22100
7	Polygon	22100
8	Polygon	22100
9	Polygon	22100
10	Polygon	13000
11	Polygon	13000
12	Polygon	10000
13	Polygon	10000
14	Polygon	10000
15	Polygon	10000
16	Polygon	10000
17	Polygon	10000
18	Polygon	10000

**Select by Attributes**

Enter a WHERE clause to select records in the table window.

Method: Create a new selection

"FID"  
"OWNCODE"  
"TOWNSHIP"  
"GEOCODE2"  
"PARCEL\_NO"  
"LEVY"

= <> Like 32000  
> >= And 34000  
< <= Or 40000  
\_ % ( ) Not 88888  
Is 90000  
Get Unique Values Go To: 92000  
99999

SELECT \* FROM ownership\_acres WHERE:  
"Acres" > 40.00 AND NOT ( "OWNCODE" >= 20000 AND  
"OWNCODE" < 40000)

Clear Verify Help Load... Save... Apply Close

TEST SER'  
TEST SER'  
TEST SER'  
TEST SER'  
TEST SER'  
TEST SER'  
TEST SER'  
TEST SER'  
TEST SER'  
TEST SER'  
EK TIMBE  
EK TIMBE  
RON SR &  
RRY & K/  
R SANDR/  
G PHILLIP  
ARV L  
CHARLES  
RY E

Record: 1

Display Source Selection

Drawing Arial 10 B I U A 100%

132136.86 139661.124 Meters

start Inbox - Microsoft O... D:\Countywide Zoni... Microsoft PowerPo... 3 Internet Explorer Hockey Arena - Arc... 1:51 PM



File Edit View Insert Selection Tools Window Help

Layer: City Limits



600



Editor

**Select By Location**

Lets you select features from one or more layers based on where they are located in relation to the features in another layer.

I want to:

select from the currently selected features in

the following layer(s):

- ☐ City Limits  
☒ Parcels

☒ Only show selectable layers in this list

that:

intersect

the features in this layer:

City Limits

☐ Use selected features (0 features selected)

☒ Apply a buffer to the features in City Limits

of: 1

Miles

Help

OK

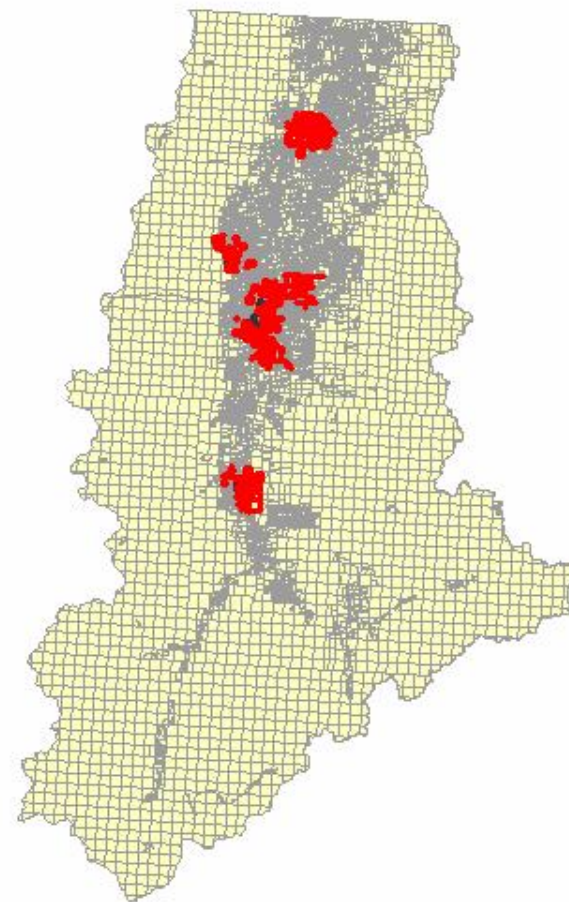
Apply

Close

**Layers**

☒ City Limits

☒ Parcels



Display Source Selection

Drawing



Arial

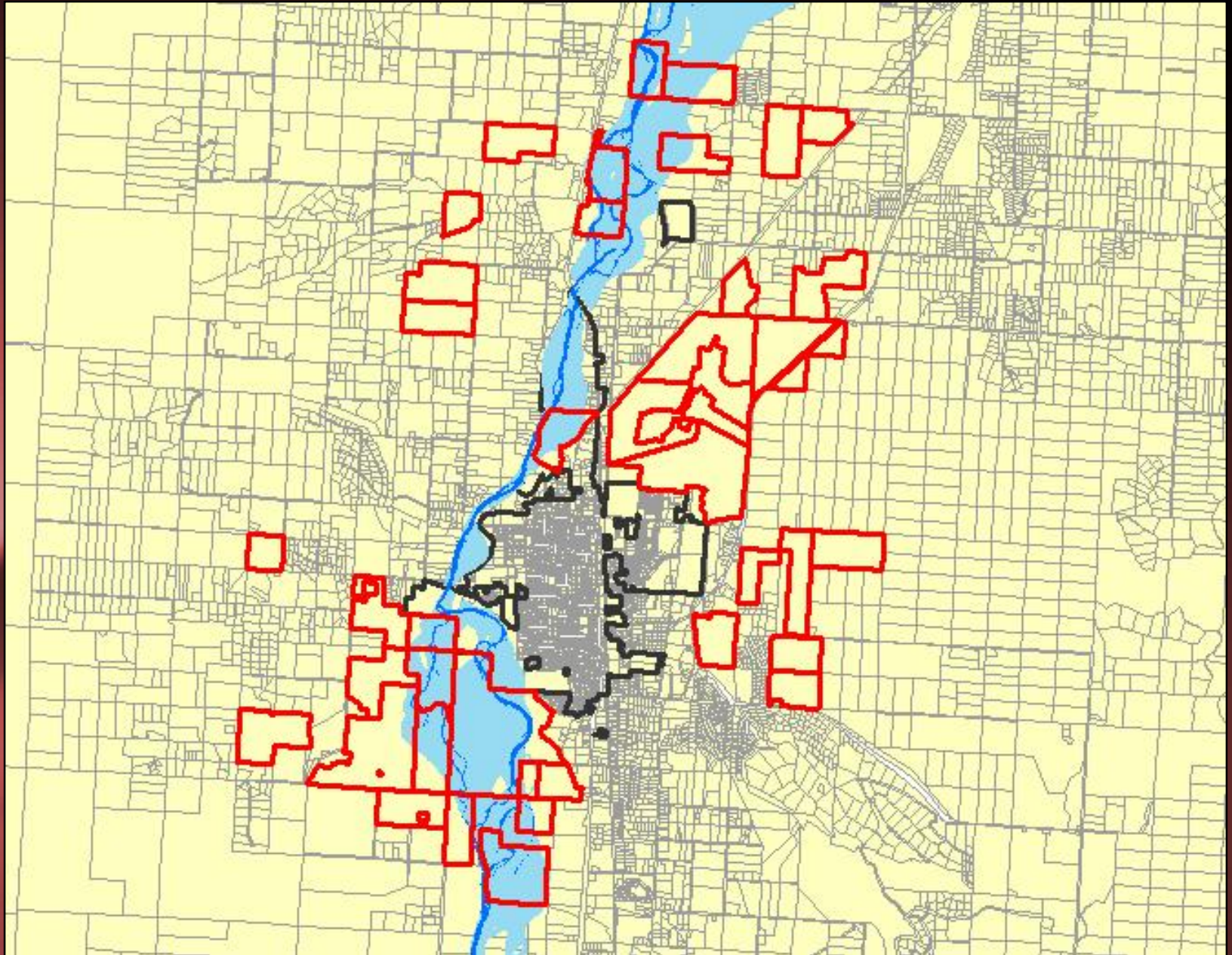
10

**B****I****U****A****Color**

190982.509 192341.99 Meters

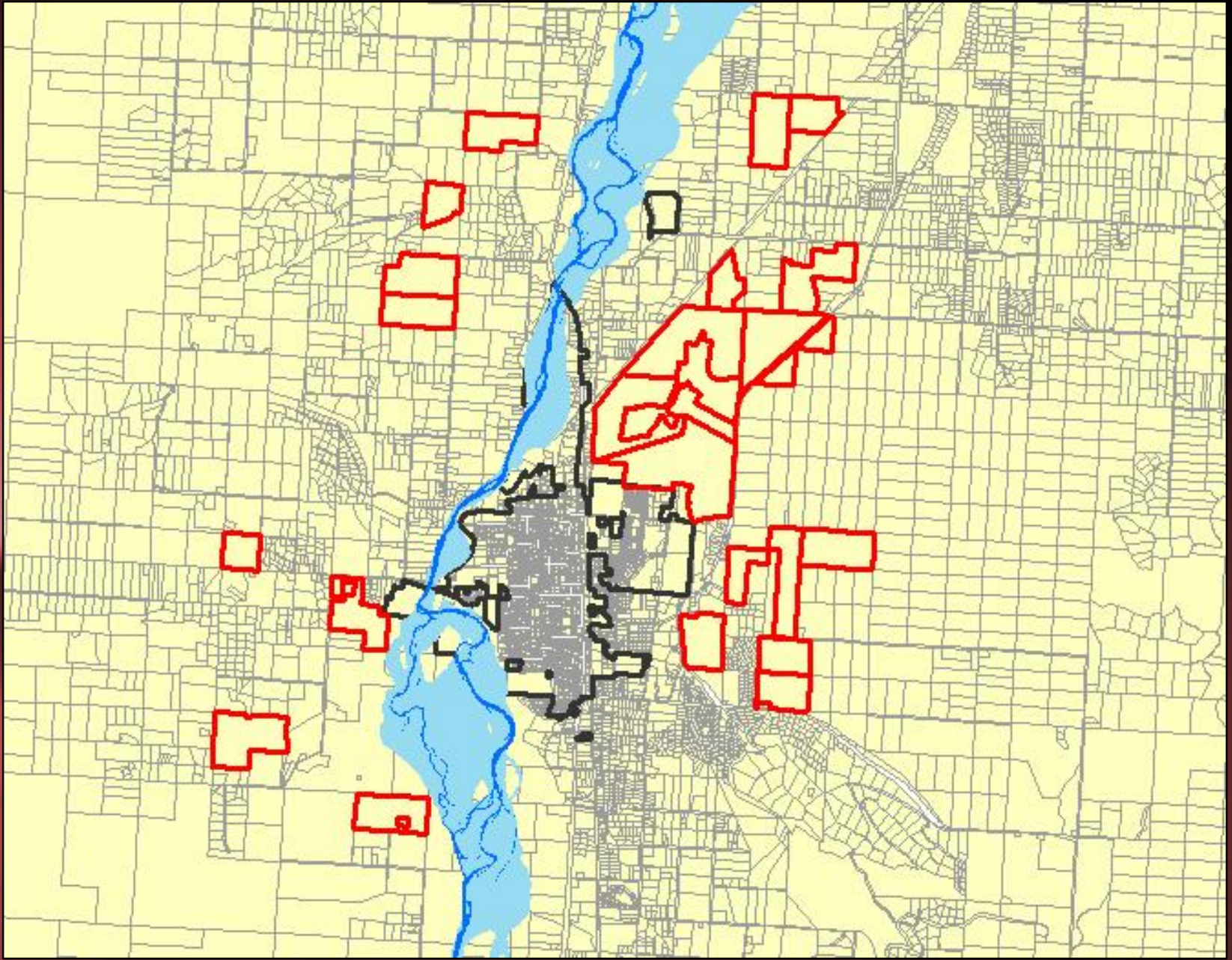


# Step 5: Analyze Results





# Step 6: Modify As Needed



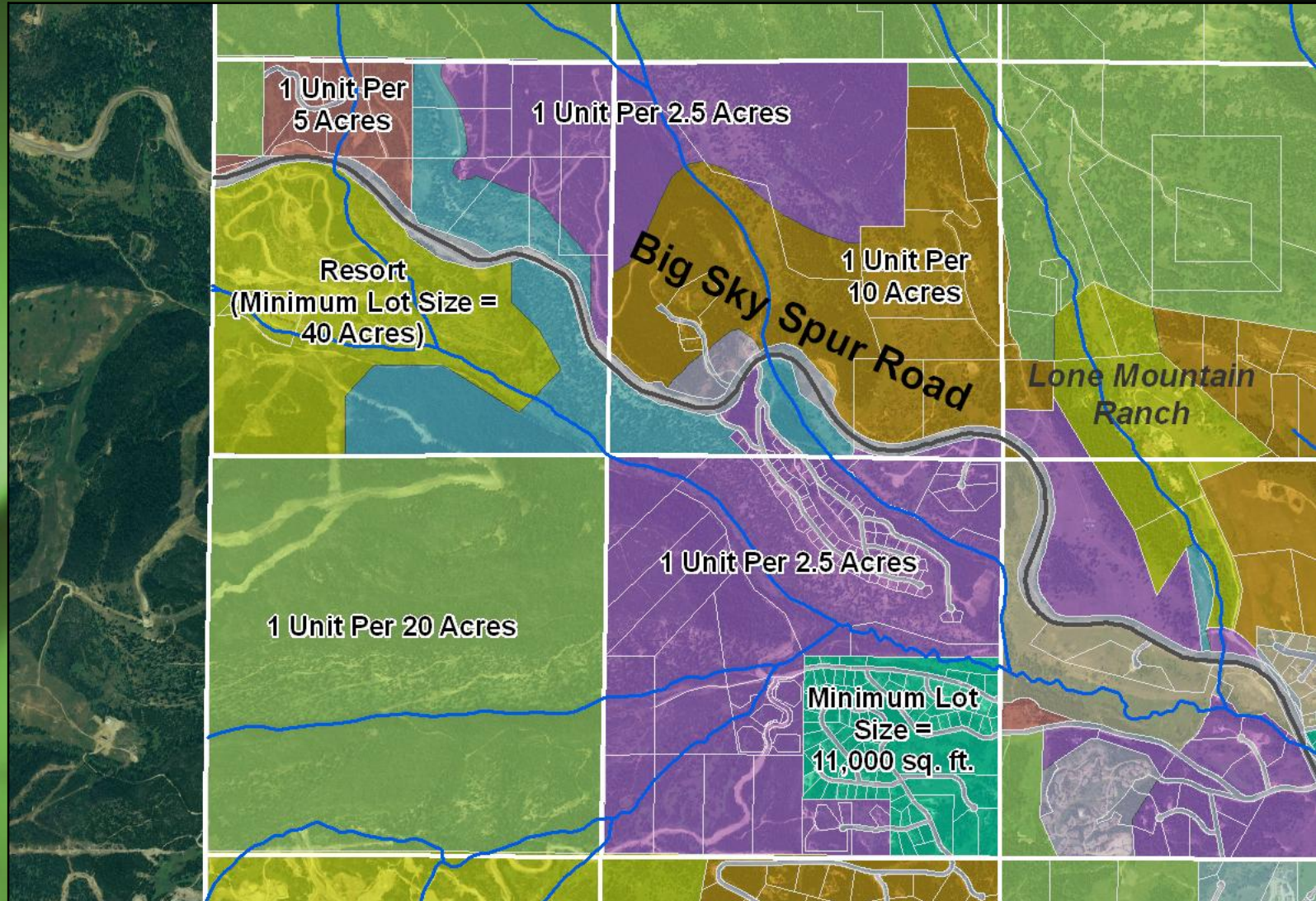


# Why GIS for Countywide Zoning?





# How do we apply the Regulations to the land?



# Tools

- ☐ **Draft Zoning Regulations**
- ☐ **Local Knowledge/Citizen Input**
- ☐ **Growth Policy**
- ☐ **Demographic Information**
- ☐ **Planning Expertise**
- ☐ **GIS!**



# **Land Suitability Analysis**

## **GIS-based Tool for Evaluating the Suitability of Land for Development**



# **Step 1: Identify Question**

**What areas in Ravalli County  
are more suitable for  
development?**

**What areas are less  
suitable?**



# Suitable for Development?



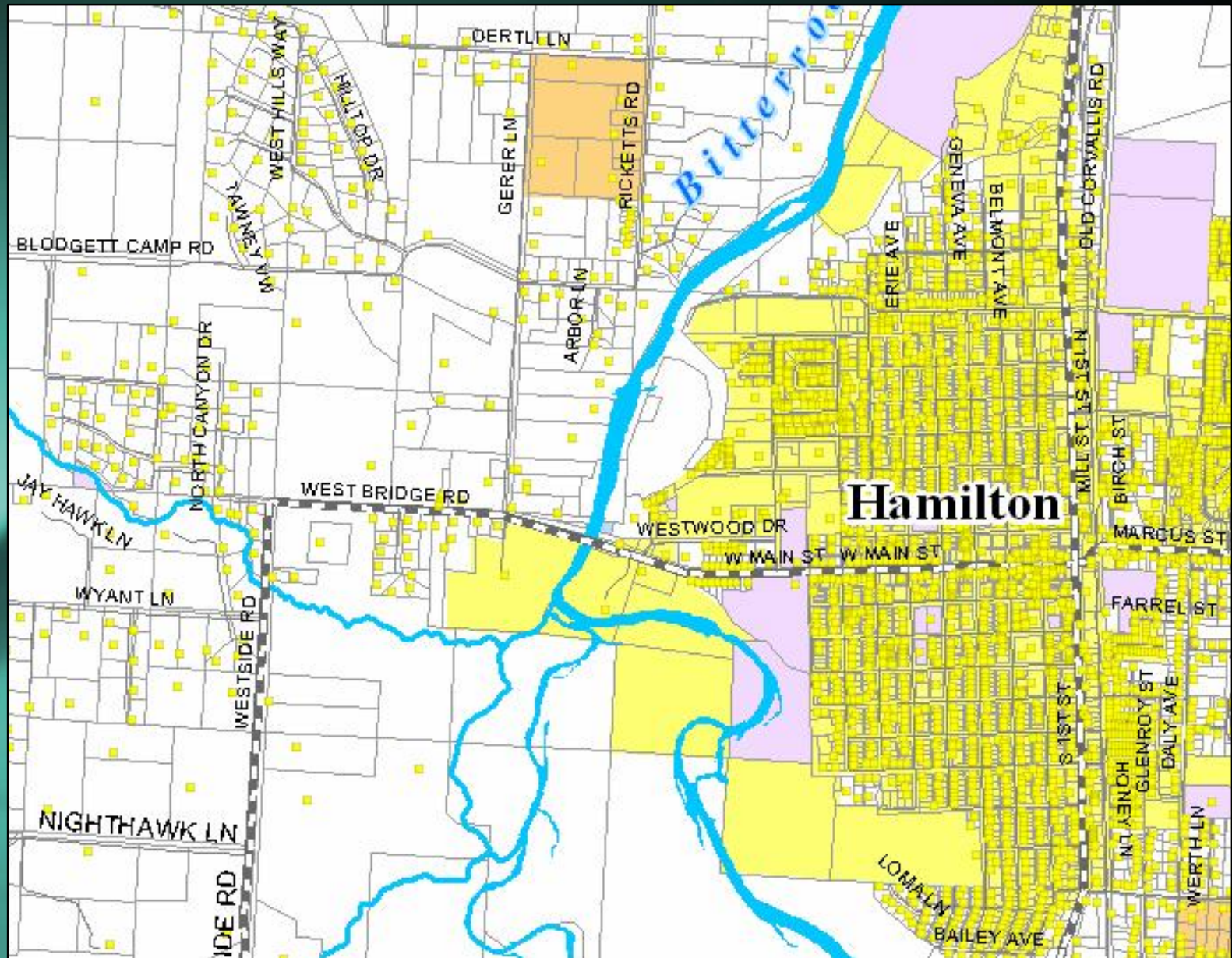


# Suitable for Development?





# Step 2: Gather Existing Layers



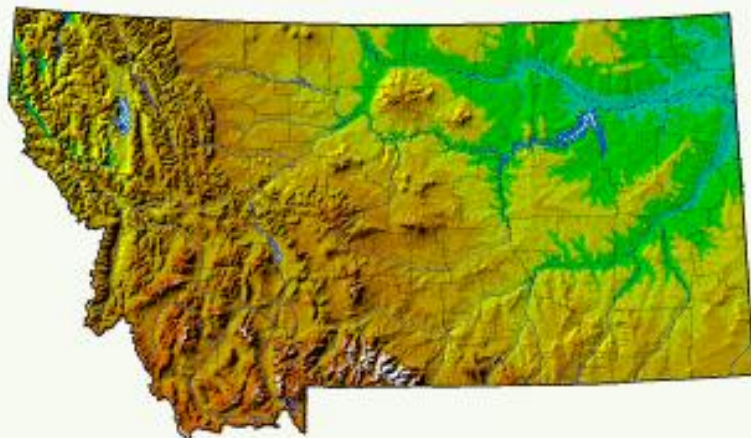


# Montana Natural Resource Information System

## Digital Atlas of Montana

[Instructions](#) | [Feedback](#)

- [About this Application](#)
- [Guided Tour](#)
- [Suggest New Map Ideas Here](#)

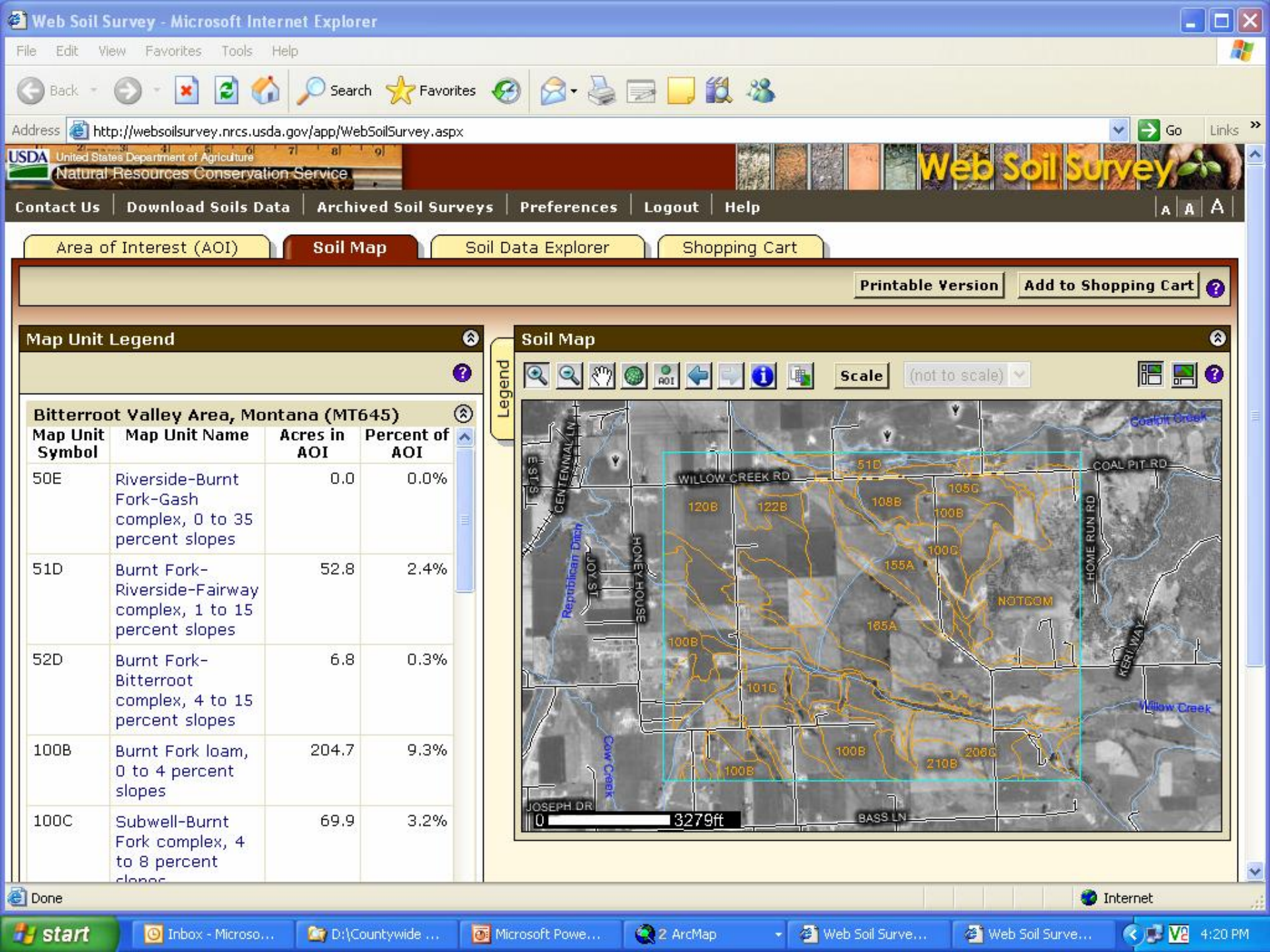


[Click here for other interactive mapping and data query applications](#)

**STEP 1: Choose one of the following search options:**

- [County](#)
- [Highways](#)
- [Indian Reservation](#)
- [Legislative Districts](#)
- [National Forest or District](#)
- [Streams](#)
- [Lakes](#)
- [Towns](#)
- [Township and Range](#)
- [Geographic Names](#)
- [Geographic Coordinates](#)
- [Tax Parcel ID](#)
- [2000 Census Geography](#)
- [Watershed Boundaries](#)
  - [Subbasins \(USGS 4th Code\)](#)
  - [Watersheds \(NRCS 5th Code\)](#)
  - [Watershed Groups \(MT\)](#)
- [Build a Custom Study Area Query](#)
- [Use the Topofinder](#) to define a study area, then use the "Click Here to view other map data for this





# **Step 3: Organize Layers Into 6 Sub-models**

- ☐ **Existing Infrastructure**
- ☐ **Public Health and Safety**
- ☐ **Water Resources**
- ☐ **Wildlife Habitat**
- ☐ **Working Lands**
- ☐ **Open Lands**

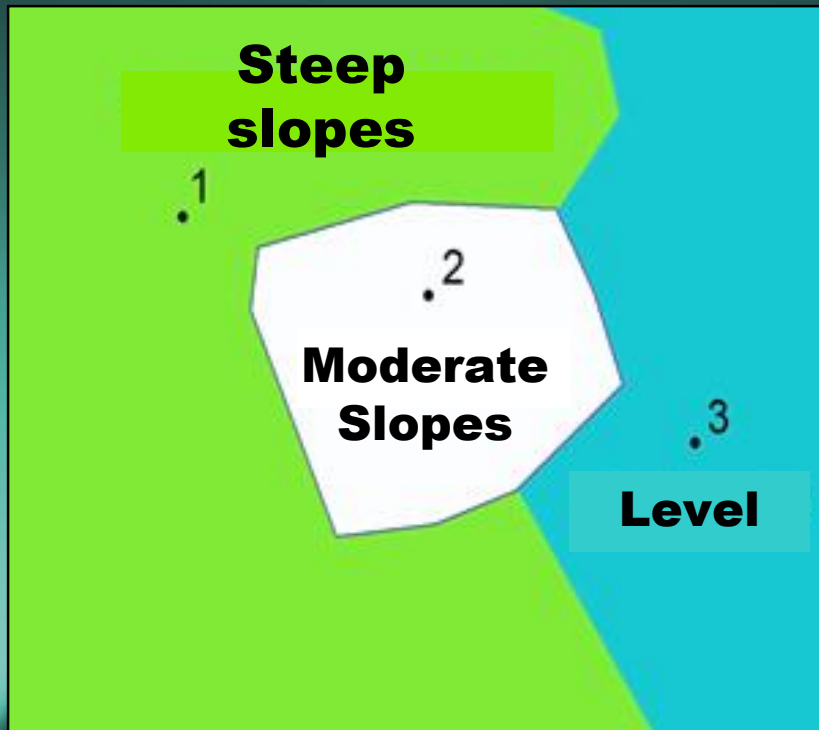


# **Step 4: Define Characteristics**

## **Public Health and Safety Submodel**

- ☐ **100-Year Floodplain**
- ☐ **Slopes > 25%**
- ☐ **Wildfire Risk**

# Step 5: Convert to Grids



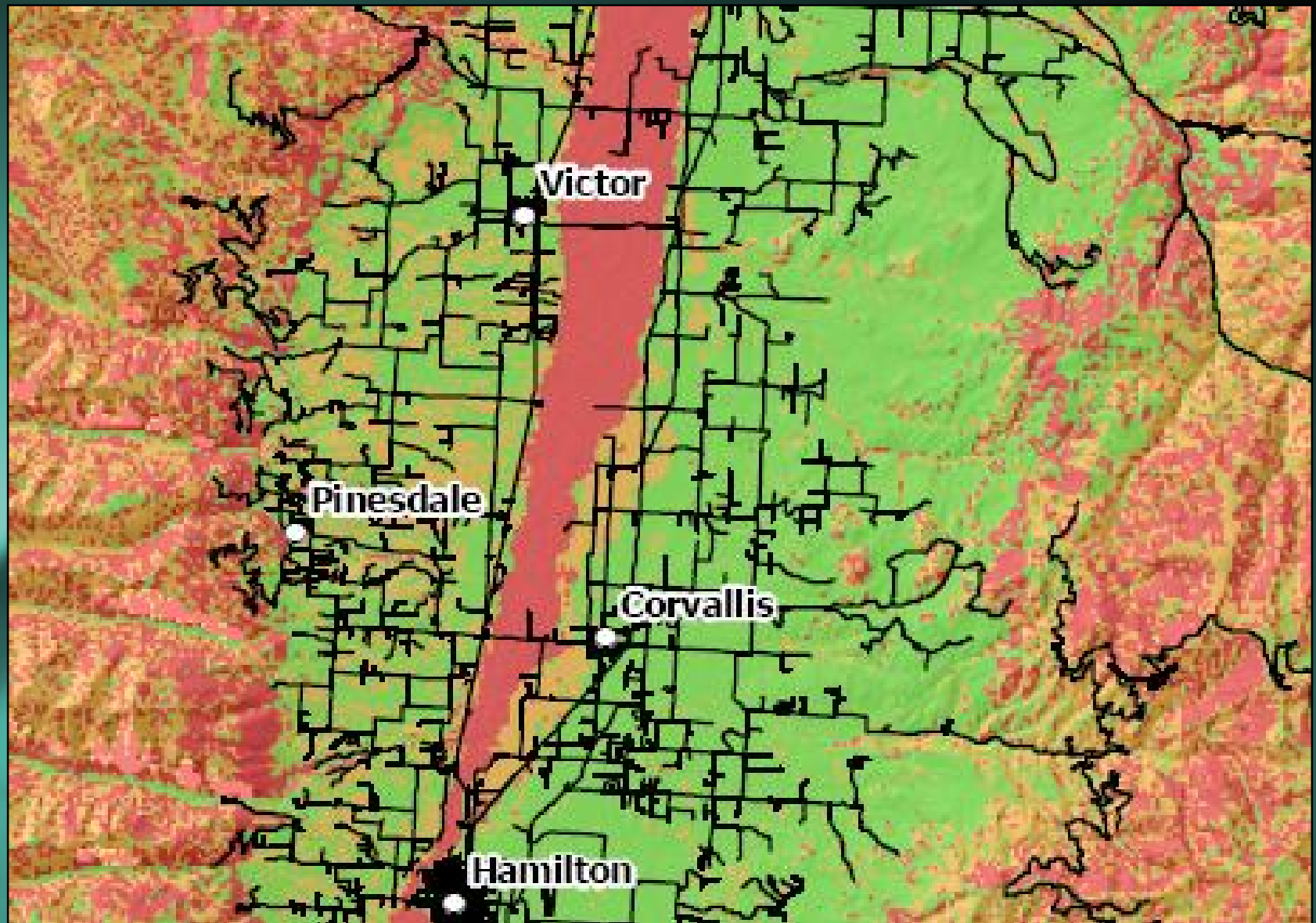
**Layers**

1	1	1	1	1	1	1	3	3	3
1	1	1	1	1	1	1	3	3	3
1	1	1	1	1	1	3	3	3	3
1	1	1	2	2	2	2	3	3	3
1	1	1	2	2	2	2	3	3	3
1	1	1	2	2	2	2	3	3	3
1	1	1	1	2	2	2	3	3	3
1	1	1	1	1	1	3	3	3	3
1	1	1	1	1	1	1	3	3	3
1	1	1	1	1	1	1	1	3	3

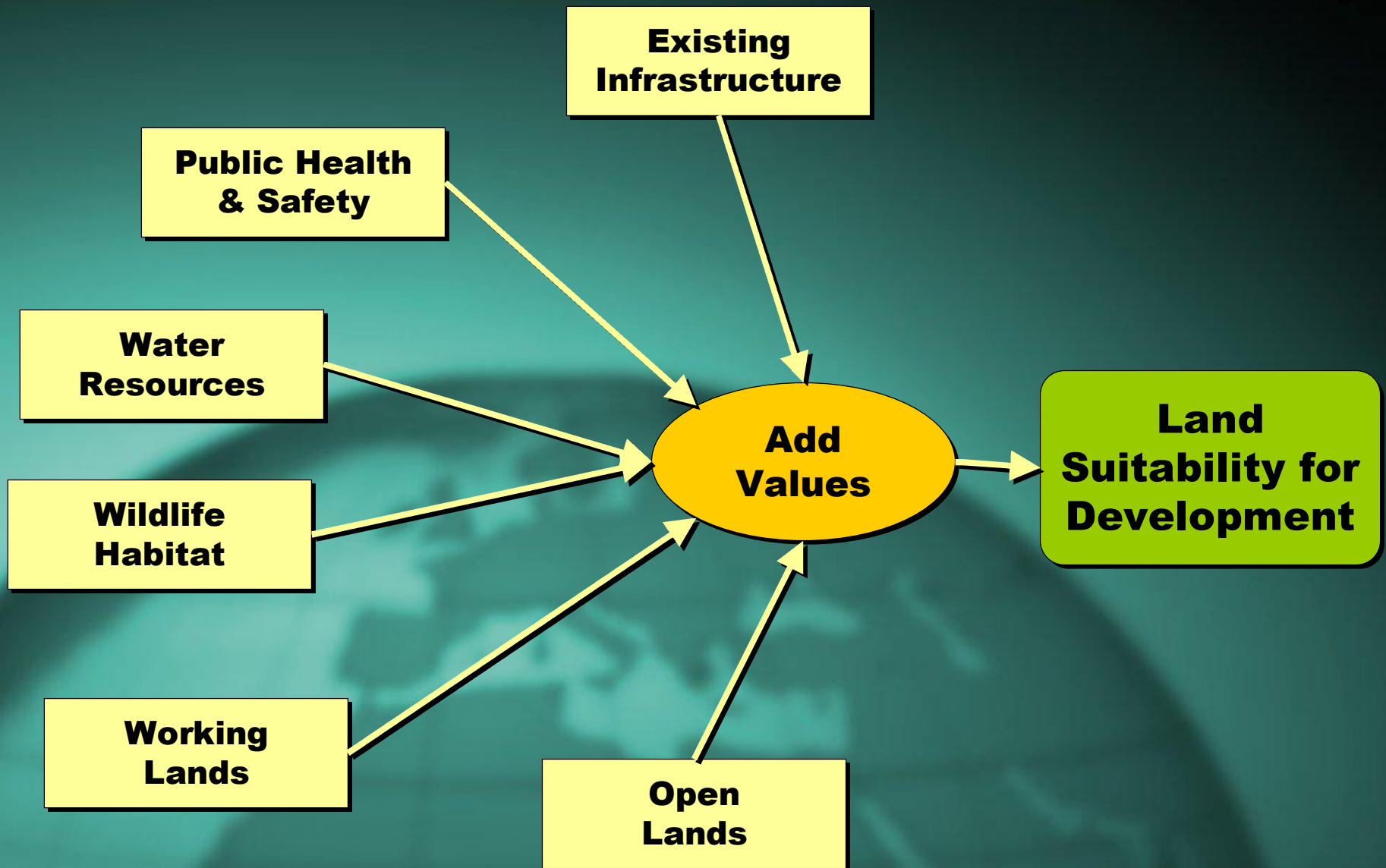
**Grid**



# Step 6: Sub-Model Results

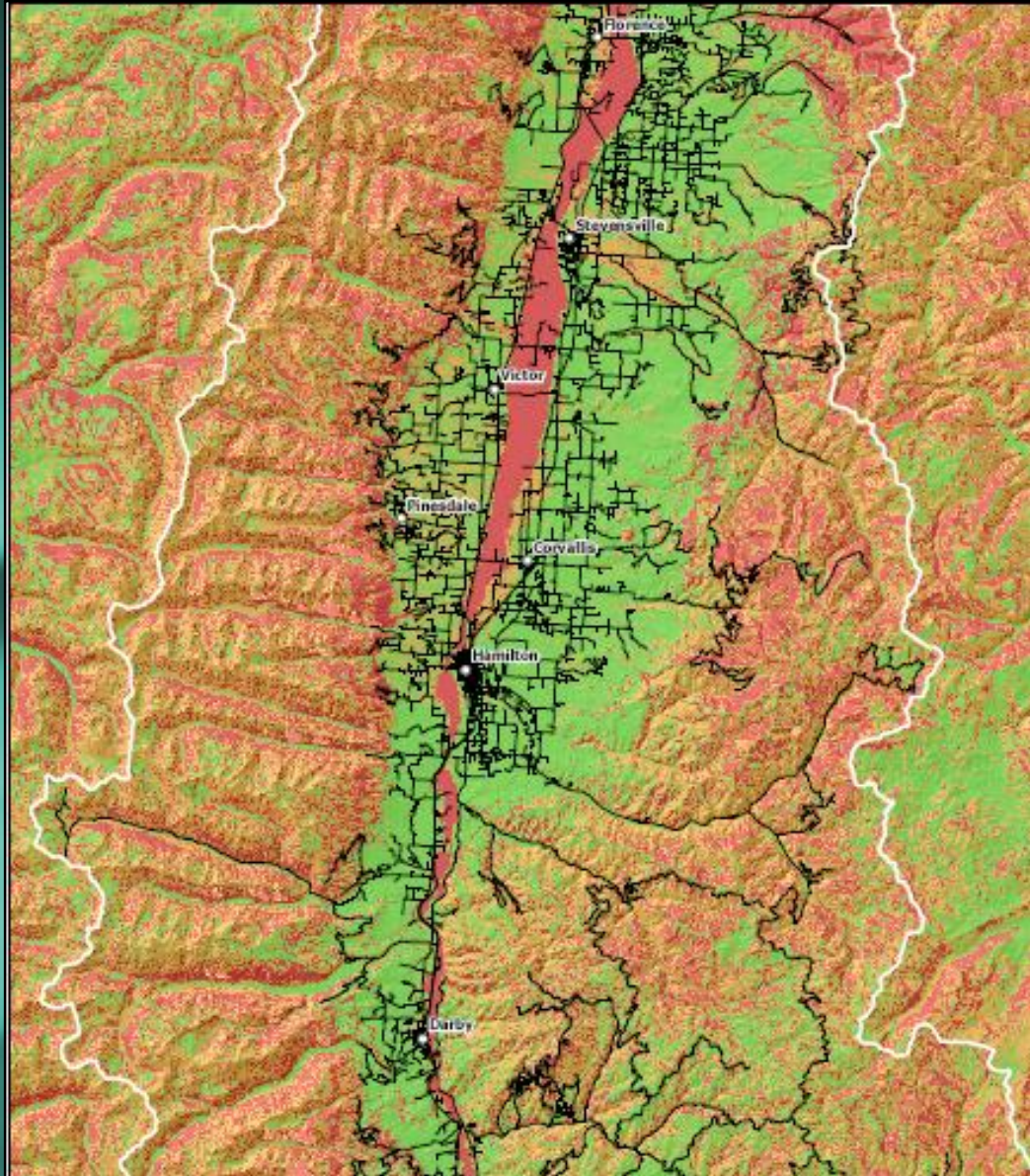


# Step 7: Combine Sub-models





# Step 8: Results



# Limitations

- ☐ **Not a Zoning Map**
- ☐ **Remember the Other Tools?**
- ☐ **Data Gaps**
- ☐ **Resolution**





# **When will the Land Suitability Analysis be done?**

☐ **Preliminary - Late January 2008**

☐ **Final – Early February**



# **Land Suitability Analysis**

## **GIS-based Tool for Evaluating the Suitability of Land for Development**

